REMARKS

(I) Rejections based on prior art

A. Summary

The claims recite that the copolymer block S has a vinyl bond content of from 5% to less than 40% as measured with respect to conjugated diene monomer units. On page 7 of the Office Action, the Examiner indicates that the vinyl content is interpreted as merely reciting the monomer ratio between the styrene and butadiene monomers. The Examiner appears to misunderstand the great importance of this feature, as described below.

The claims also recite that the hydrogenated copolymer A contains 40-60 wt. % vinyl aromatic monomer units. Applicants previously cited examples in the reference indicating a different content of vinyl aromatic monomer units. The Examiner did not accept this argument because the examples did not relate to a styrene-butadiene copolymer. As described below, the Examiner fails to appreciate that the Examples were cited because they are substantially the only thing in the reference that relates to the claimed content of vinyl aromatic monomer units. There are no examples relating to a styrene-butadiene copolymer, and there is nothing in the reference to suggest the claimed content of vinyl aromatic monomer units.

B. Discussion

In the outstanding Office Action, the rejection of the claims over Karande et al. [WO 02/068529 A2] (hereinafter, referred to as "Karande '529") in the previous Office Action dated June 22, 2007 is maintained (see item 5 appearing at pages 3-5 of the Office Action). However, the Applicants disagree with the Examiner and wish to traverse as follows.

In the outstanding Office Action, the Examiner states that the Applicants' arguments concerning the rejection over Karande '529, made in their previous response of November 21, 2007, are not persuasive (see item 8 appearing at pages 6-8 of the Office Action). However, the Examiner appears to fail to correctly understand the Applicants' arguments.

As explained in the Applicants' previous response, the polymer foam of the present invention contains a hydrogenated copolymer (A) obtained by hydrogenating an unhydrogenated copolymer comprising vinyl aromatic monomer units and conjugated diene monomer units, wherein the unhydrogenated copolymer contains at least one specific copolymer block S. The hydrogenated copolymer (A) has the following important features (I), (II) and (III):

(I) The copolymer block S (contained in the unhydrogenated copolymer from which the hydrogenated copolymer (A) is obtained by hydrogenation) is comprised of vinyl aromatic monomer units and conjugated diene monomer units and has a vinyl bond content of from 5 % to less than 40 % as measured with respect to conjugated diene monomer units.

(II) The hydrogenated copolymer (A) has a content of the vinyl aromatic monomer units of from more than 40 % by weight to 60 % by weight, based on the weight of the hydrogenated copolymer (A).

(III) At least one peak of loss tangent (tanδ) is observed at -40 °C to lower than -10 °C in a dynamic viscoelastic spectrum obtained with respect to the hydrogenated copolymer (A).

As explained in the Applicants' previous response, by the use of the hydrogenated copolymer (A) having the above-mentioned features (I) to (III), the polymer foam of the present invention exhibits excellent properties with respect to flexibility, low temperature characteristics (such as flexibility at low temperatures) and shock-absorbing property (low impact resilience).

Karande '529 is directed to fabricated articles prepared from blends of substantially random ethylene/propylene/vinyl aromatic monomer interpolymers with propylene homopolymers or copolymers (see page 1, lines 4-6 of Karande '529). Karande '529 has no teaching or suggestion about the hydrogenated copolymer (A) used in the present invention. More specifically, with respect to at least features (I) and (II) of the hydrogenated copolymer (A), Karande '529 has no teaching or suggestion. On this point, more detailed explanation is given below.

The polymer block S recited in feature (I) has the following two characteristics (I-1) and (I-2):

(I-1) The polymer block S is comprised of vinyl aromatic monomer units and conjugated diene monomer units.

(I-2) The polymer block S has a vinyl bond content of from 5 % to less than 40 % as measured with respect to conjugated diene monomer units.

With respect to feature (I), which is separated into the above-mentioned characteristics (I-1) and (I-2), the Examiner states in the outstanding Office Action as follows:

> "However, regarding (I-1), applicants are reminded that styrene is inherently a vinyl aromatic monomer, and butadiene is inherently a diene monomer. Since Karande '529 teaches a hydrogenated

> styrene-butadiene copolymer, i.e., at least one copolymer block S, it is not unseen that Karande does not anticipate (I-1). Regarding (I-2), the vinyl content with respect to diene monomer units is interpreted as merely reciting the monomer ratio between the styrene and butadiene monomers. Since the monomer ratio inherent effects the property of copolymer, the examiner maintains that a workable monomer ratio is deemed to be an obvious routine optimization to one of ordinary skill in the art, motivated by the desire to obtain required properties for the same end use as the claimed invention." (see page 7, lines 9-17 of the Office Action).

Karande '529 teaches a styrene/butadiene random copolymer and, hence, may anticipate characteristic (I-1). However, with respect to at least characteristic (I-2), Karande '529 has no teaching or suggestion and, hence, feature (I) is never taught or suggested by Karande '529.

According to the Examiner, the vinyl bond content referred to in feature (I) (or in characteristic (I-2)) merely recites the content of the conjugated diene monomer units in the polymer block S and, hence, the range of the vinyl bond content defined in feature (I) (or in characteristic (I-2)) is an obvious routine optimization to a person skilled in the art. However, the Examiner's recognition is not correct.

Contrary to the Examiner's recognition, the vinyl bond content referred to in feature (I) (or in characteristic (I-2)) does not mean the content of the conjugated diene monomer units in the polymer block S, but means the amount of specific double bonds contained in the conjugated diene monomer units in the polymer block S. This is explained below with reference to a case where the conjugated diene monomer units are butadiene monomer units.

Each butadiene monomer unit has a double bond, which is classified into "1,2-bond" (vinyl bond) and "1,4-bond". For showing this, the Applicants submit the following document as Exhibit:

Kirk-Othmer, Encyclopedia of Chemical Technology, Fourth Edition, Volume 4, pages 663-690

As explained in page 674 of Exhibit (see especially Fig. 2), the double bond in a polybutadiene is classified into "1,2-bond" ("1,2-addition") and "1,4-bond" ("1,4-addition"). In this connection, it should be noted that "1,2-bond" is also referred to as "vinyl bond", which is seen from the description of Exhibit, reading "Typical vinyl (1,2-addition) content is . . ." (see page 675, third paragraph of Exhibit).

Therefore, the vinyl bond content referred to in feature (I) (or in characteristic (I-2)) means the amount of specific double bonds contained in the conjugated diene monomer units in

the polymer block S, and has no direct relationship with the amount of the conjugated diene monomer units in the polymer block S.

Karande '529 has no teaching or suggestion about the vinyl bond content as measured with respect to conjugated diene monomer units. In this connection, it should be noted that the EXAMPLES of Karande '529 do not disclose a polymer comprising both vinyl aromatic monomer units and conjugated diene monomer units, let alone a polymer containing a polymer block comprised of vinyl aromatic monomer units and conjugated diene monomer units. Therefore, it is impossible to obtain any information regarding a vinyl bond content as defined in feature (I) (or in characteristic (I-2)) by replicating the EXAMPLES of Karande '529.

Thus, Karande '529 has no teaching or suggestion about feature (I) of the hydrogenated copolymer (A) used in the present invention.

With respect also to feature (II) of the hydrogenated copolymer (A) used in the present invention, this feature is not taught or suggested by Karande '529. For showing this, the Applicants argued in the previous response as follows:

> "With respect to the hydrogenated random styrene/butadiene copolymer used in Karande '529, Karande '529 has no description about a specific range of the styrene monomer unit content of the hydrogenated copolymer. In this connection, it should be noted that the EXAMPLES of Karande '529 never disclose a polymer having a styrene monomer unit content within the range (more than 40 % by weight to 60 % by weight) recited in feature (II). Specifically, as polymers containing styrene monomer units, the EXAMPLES of Karande '529 discloses polymers EPS 1, EPS 2 and ES 1 (see pages 12-15 of Karande '529). The styrene monomer unit contents of these polymer are described in Table 1 appearing at page 15 of Karande '529, which shows that the styrene monomer unit contents of polymers EPS 1, EPS 2 and ES 1 are respectively 14 % by weight, 24 % by weight, 30 % by weight, none of which is within range (more than 40 % by weight to 60 % by weight) recited in feature (II)." (see page 23, lines 15-25 of the Applicants' previous response of November 21, 2007)

In response to the Applicants' argument, the Examiner states in the outstanding Office Action as follows:

> "However, the exemplified polymers are not styrene-butadiene copolymers. Applicants' argument is clearly misplaced." (see page 7, lines 2-1 from bottom of the Office Action)

The Examiner's argument is traversed as follows.

As the Examiner states, polymers EPS 1, EPS 2 and ES 1 are not styrene-butadiene copolymers. However, since the EXAMPLES of Karande '529 do not disclose any styrene-

butadiene copolymer, the Applicants referred to polymers EPS 1, EPS 2 and ES 1 as polymers which contain styrene monomer units but which do not contain butadiene monomer units, and showed in their previous response that even polymers EPS 1, EPS 2 and ES 1 do not have a styrene monomer unit content within the range defined in feature (II). Therefore, it is apparent that Karande '529 has no teaching or suggestion about feature (II) of the hydrogenated copolymer (A) used in the present invention.

Thus, at least features (I) and (II) are never taught or suggested by Karande '529.

With respect to low temperature characteristics (such as flexibility at low temperatures), the Examiner appears to understand that this effect is not achieved by the present invention on the ground that the low temperature characteristics are not described in the claims (see page 8, line 6 of the outstanding Office Action). Applicants agree that the characteristics are not claimed. However, the Examiner's understanding is not correct, because the low temperature characteristics may be achieved by the polymer foam defined in claim 1 of the present application, which contains the hydrogenated copolymer (A) having features (I), (II) and (III).

With respect to flexibility and shock-absorbing property, the Examiner states as follows:

> "As to shock-absorbing property, since Karande '529 teaches the same subject matter of the same structure and composition, and for the same use as cushions as the claimed invention, selecting a composition having a workable flexibility or shock-absorbing property is deemed to be an obvious routine optimization, motivated by the desire to obtain the same required properties for the same end use." (see page 8, lines 6-11 of the Office Action)

The above statement of the Examiner is also groundless. As explained above, Karande'529 does not have any teaching or suggestion about at least features (I) and (II). Further, Karande '529 does not teach or suggest that, by the use of the hydrogenated copolymer (A) having features (I) to (III), the polymer foam of the present invention exhibits excellent properties with respect to flexibility and shock-absorbing property (low impact resilience) as well as low temperature characteristics (such as flexibility at low temperatures). In this connection, it should be noted that Karande '529 intends to obtain fabricated articles which exhibit high toughness, tensile properties, heat resistance and low stress whitening and which further can exhibit desirable optical properties, especially when in the form of a film or sheet (see page 1, lines 6-8 of Karande '529). The effects which Karande '529 intends to achieve are different from the effects potentially achieved in the present invention.

From the above, it is apparent that claim 1 of the present application has novelty and unobviousness over Karande '529.

Now that the novelty and unobviousness of claim 1 over the prior art has been established, the novelty and unobviousness of the remaining claims over the prior art is also apparent.

(II) Election

Applicants are pleased that the Examiner is now considering claim 6. However, the Office Action seems to indicate that the October 13, 2006 Election of Species requirement should be considered as being between copolymers containing a block S, but not a block H, and copolymers containing blocks S and H in any combination. However, in view of the Election of Species requirement mailed on March 19, 2007, it is apparent that the Examiner understood the October 13, 2006 Election of Species to have a different meaning. Applicants submit that it is improper for the Examiner to change the meaning of the October 13, 2006 Election of Species requirement to something different from what both Applicants and the Examiner understood to be the meaning at that time.

(III) Conclusion

From the foregoing, it is firmly believed that all of the Examiner's objections and rejections have been overcome. Early and favorable action is respectfully solicited.

Claims 1-15 are pending. Claims 1-4, 6-8 and 11-15 are under consideration.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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